

CROSS FERTILISATION THROUGH ALIGNMENT, SYNCHRONISATION AND EXCHANGES FOR IoT

H2020 – CREATE-IoT Project

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1. EXECUTIVE SUMMARY

Publishable summary

The purpose of the co-creation workshops is to present a model for rethinking the technologies being deployed in specific use cases of the Large-Scale Pilots (LSPs) and at the same time communicate and disseminate the LSPs towards a wider audience. However, the outputs of the case study are to be communicated primarily to the correspondent LSP and are published in the Large-Scale Pilots wiki.

The creative and dissemination processes are presented within, with the performance of the first experimental co-creation workshop around the ‘Connected Hennerly’ artwork proving the success of the interactive model. Different perspectives of all involved have an impact on the way the subject in discussion is perceived. The practical approach and ludic (playful) aspect of the workshop allows for better interaction between participants. Furthermore, the fact that the artwork transports people to a wakened state of curiosity; improving their engagement.

A strong background aim is to contribute to the communication of technological advancements facilitated by the EU investments in IoT. It can be observed, that the dissemination of results tends not to reach citizens and small companies which are considered as the most relevant potential up-takers and adopters of the innovations made possible by the LSPs. The artistic approach is very relevant in this as it is believed that IoT differs from previous technological developments because the success of IoT in general depends on the creativity of entrepreneurs to create innovative combinations of off-the-shelf sensors, actuators and algorithms.

This document is one out of seven deliverables based on task T03.01 (Creation, innovation and adoption - Methodology for integrating ICT and Art).

Non-publishable information

This document is public.

2. INTRODUCTION

2.1 Purpose and target group

The purpose of the co-creation workshops is to present a model for rethinking the technologies being deployed in specific use cases of the Large-Scale Pilots (LSPs) and at the same time communicate and disseminate the LSPs towards a wider audience. The outputs of the action were also communicated to the Large-Scale Pilot in question.

The target group is broad:

- Citizens in general - to whom we aim at communicating the efforts the EU is putting directly on the ground in the general field of IoT;
- Companies - which are preferred targets to communicate the actions of the Large-Scale Pilot to the LSP should focus on the same area of business as the targeted companies in order for them to adopt and implement the same of similar IoT appliances;
- Policy makers - local and/or regional governing bodies which can further promote the European actions and mediate future processes of integration.

The discussion between all parts is triggered by an artistic provocation in form of an artwork that can later become an appliance or a product if further developed. Something that is very close to daily life and can be understood in that context. The artwork itself is not a mere critique about the subject of massive production of poultry meat. It criticises certain aspects of appliance in question. It highlights certain aspects that are found by the artists as more positive and constructive. Lastly, it proposes a concrete application of the same technology based on those more positive premises.

Structure of the activities: This deliverable describes the co-creation activities undertaken over a period of 13 months and consists of the following events:

- The Connected Henney, IoT Week 2018. Bilbao, Spain, June 4, 2018.
- STARTS Presentation, Porto Museum of Contemporary Arts. Porto, Portugal, October 26, 2018.
- The Connected Henney. Estarreja, Portugal, May 7, 2019.

2.2 Contributions of partners

This delivery document is mainly prepared by ARTS and assisted by SINTEF.

2.3 Relations to other activities in the project

The outputs of this case study are to be communicated primarily to the correspondent LSP and are published in the Large-Scale Pilots wiki. For the methodology for integrating ICT and Art we also refer to "CREATE-IoT methodology" at the wiki [1]. Due to their high visibility these activities are also a very powerful dissemination tool. Therefore, a strong contribution to the dissemination work package is also implied in them.

3. CREATIVE PROCESS

3.1 Choice of LSP and correspondent use case

IoF2020 is possibly the most relevant of all the LSPs. It addresses the pressing global issue of food production and distribution. Furthermore, through being implemented in the EU, the case is made for more than just quantity of food needed. The EU is the global region where quality is seen as also an extremely important factor in food production and retail [2]. The above aspects defined the selection of the LSP to be firstly addressed in the first experimental activity in the context of arts inspired co-creation.

Meat production is interesting as a subject because it raises issues related with the quality of life of animals. Animals rights are slowly but steadily entering policy agendas and politics in general [3]. A growing number of people are becoming vegetarians in order to avoid eating meat and not to contribute for the production and killing of animals. Poultry Chain Management was the use case that arose as apparently contributing to exactly the opposite of the described above, a massive production of poultry without taking animal welfare in consideration. Even the image provided on the IoF2020 site indicates the direction of massive production of poultry meat.



Figure 1: Image published on the webpage of the Poultry Chain Management use case of IoF2020

The collaboration with IoF2020 was also facilitated by the partners' participation in the organisation of IoT Week 2018.

3.2 Exploration phase

In the exploration phase of the creation of the artwork information was gathered from contacts with the partners responsible for the use case. The most relevant included an interview with the coordinator of the use case at the time, Mikel Larrañaga of IK4 Tekniker. Due a change in the coordinator of the use case, communication was frustrated. The interview with Mikel was relevant because he pointed out more positive aspects of appliances in the use case than the more negative ones that were noted in a first impression.

For example, the fact that bracelets are used by truck drivers in the system in order to monitor the way chickens are handled during transport from farm to slaughter is an indication of the goodwill of treating the animals with care and respect until their moment of death. This and other

aspects, such as conditions for well-being and minimum space between animals, are not well enough communicated in the public promotion of the use case.

Further research outside the activities of the use case, revealed certain tendencies that were determinant for the creation of the artwork:

- Food retail companies are aware that clients research more and are willing to pay a premium for higher quality food products, often searching for labels such as bio and organic.
- Food retail companies are investing in creating new products and working closely with food producers in order to fulfil the needs of their clients.
- There is a significant body of research on the correlation of quality of life of animals and the quality of the food they generate.
- Permaculture¹ is a growing tendency in agriculture in general and most importantly in the context of the development of circular economies.
- Within permaculture the use of living tractors is returning. Living tractors are chicken henneries that are positioned and moved in agricultural fields. They use hens to clean and fertilize the fields in substitution of chemically produced nutrients and pesticides [4].

As an anecdote, we can mention that a strong artistic reference for the critical part of methods of massive production of chicken was a specific scene of a famous film from the 90's of the past century, entitled Baraka. In that scene, poultry chain management systems are compared with transport systems in Tokyo. A possible interpretation of the critique from that scene goes in the direction of people in Tokyo being treated as chicken in an industrial farm.

3.3 CREATE Your IoT series

The CREATE Your IoT Series resulted from the desire for making technologies used by the LSPs accessible to other companies or individuals. That idea is two-fold. On the business-to-business (B2B) perspective there is the potential of SMEs to generate new businesses out of similar appliances in different contexts. Even individuals can create start-ups based on products and services at the intersection of combinations of technologies used in different LSPs. From the perspective of the final consumer, a significant part of IoT technologies are to be applied by the user. For better adoption users can better understand those technologies by participating in the co-creation workshops proposed. The notion of creating our own IoT is to give companies and individuals the sensation of belonging and ownership that is crucial for acceptance and adoption of new technologies.

3.4 The Connected Henneries



Figure 2: CREATE Your IoT Logo adapted to The Connected Henneries

¹ An approach to life and growing food that copies the way things happen in nature in order to create ways for people to live without damaging the environment, (Source: Oxford Learner's Dictionaries).

In this instance of the CREATE Your IoT Series, The Connected Hennery, participants can learn how to make a very special hennery. It allows chicken to slowly move it around an agricultural field, clean it and get it ready for planting. The Connected Hennery can be seen as an application of basic artificial intelligence in the field of Internet of Things. It analyses and predicts the movement of chicken and moves along with them. It could be a new product for permaculture in-between industrial and free-range chicken production.

“Life imitates art far more than art imitates Life” (Oscar Wilde)

The Connected Hennery is artistically inspired also in the work of George Orwell. The author of books such as 1984 and Animal Farm who believed that the arts could strongly influence real life. The Connected Hennery revisits those concepts and represents a transitional technologically enabled model of socioeconomic organization.

During the workshop participants learned how The Connected Hennery can be assembled and how it works. The intention is, however, is not to provide them with a kit to be assembled and replicated, but instead to create a reference for each participant to be inspired to create his or her own version of the connected hennery. That is therefore an emphasis on the creative part needed for the implementation of IoT in the EU.



Figure 3: Luis Miguel Girao (CREATE-IoT) and Pedro Malo (IoF2020/CREATE-IoT) interacting around and about the artwork, in IoT Week 2018, in Bilbao

The most important part of the activity are the dialogues generated about The Connected Hennery. This is why the workshops engage policy makers whom can then have a better understanding of the impact of the development of IoT on their constituents.

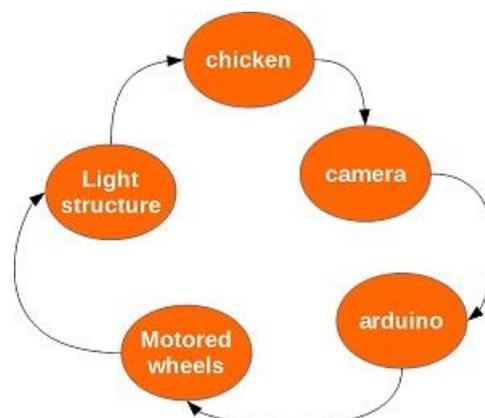


Figure 4: Interaction scheme of the artwork

The interaction scheme of the artwork is very simple. It is a closed loop in which the chicken has partial control of the movement and position of the hennery. Connection to other systems and data broadcasting is done via Wi-Fi in the Arduino.



Figure 5: The Connected Hennery in the exhibition of IoT Week 2018 in Bilbao

Even when in exhibition only mode, The Connected Hennery is never presented as a "finished work". It is presented as an open "unfinished" work because the main aim is to inspire others to keep developing it or something similar on their own. The artwork is built along the exhibition time and with the help curious audience are represented in Figure 3.

In summary, The Connected Hennery provides the artwork as the medium for a dialogue between the LSPs, other companies and citizens moderated by policy makers.

4. DISSEMINATION PROCESS

4.1 Contact with local authorities

The realization of the first co-creation workshop was a consequence of a presentation by Luis Miguel Girao, in the Contemporary Art Museum of Porto, Serralves, in Portugal. The presentation was about the artistic work being developed in the context of the collaboration between the LSPs and STARTS through the CREATE-IoT project. It was a workshop dedicated to policy makers of several Municipalities in Portugal [5]. The deputy in charge of Culture and Tourism of a small city of the central region of Portugal, Estarreja, was inspired by the concept of the Connected Hennyery and invited us to make the workshop in its local market.



Figure 6: The Municipal Market of Estarreja

One of the aims of the co-creation workshops is to connect directly with daily life. Therefore, they are planned to be carried out in locations where final users and citizens are present. In this case, due to weather conditions, the workshop was relocated to the local library. Therefore, the interaction with unexpected passers-by was not possible. Engagement with young population was a significant point of the workshop.



Figure 7: The local market supplier of living chicken and eggs

One of the most interesting aspects of the co-creation workshops is that they make a direct connection from the management world of the LSPs with the life of people that have no notion that the LSPs exist. That is most of the times of the general population, but it is also certainly the case of the majority of policy makers, being them from a local, regional, national or EU level.

The Mayor of the Municipality opened the workshops and participated in it until the end. The session was closed by the deputy for Culture and Tourism. The Municipality had also the role of engaging the biggest company in chicken production in Portugal and it certainly had an influence on the ongoing negotiations for further activities to be planned with that company, by its own initiative.

4.2 Contact with companies

The main source of engagement with companies originated in previous contacts of the organizer, ARTSHARE. All of those previously established contacts grew from activities related with the CREATE-IoT project.

SONAE is one of the biggest capital group in Portugal. They own the biggest national food retailer, Continente. They were involved in a bid to create a strategic national IoT project in Portugal, triggered by UNPARALELL, a partner in CREATE-IoT and IoF2020. A visit to their locations where their experiment innovations revealed that SONAE is very interested in the subject.

ALTICE is the main telecom in Portugal and is the second to Orange in France. ALTICE participated in the CREATE-IoT panel organized by ARTSHARE in the Museum of Art, Architecture and Technology (MAAT) in Lisbon. In that panel ALTICE was exposed to the idea of The Connected Henney and declared clearly its will to engage in further events.

LUSIAVES is the biggest producer of chicken in Portugal. The group has more than 20 companies. In its company in Estarreja, they run one of the most advanced poultry slaughters in Europe, with the capability of delivering 12000 chicken per hour. Being exposed to the LSPs, the company immediately declared its will to engage. After the discussion, it as well understood, the potential of The Connect Henney as a future product, of connecting with the IoF2020 LSP as well as innovating their production and distribution chain with IoT appliances.

4.3 The role of the Wiki

The European Large-Scale Pilots Wiki is the knowledge repository for the Connected Henney. Information about the project can be found there mostly concerning the artistic concept and practical information about how to make the Henney. Open source code and hardware can be found there as well as the open architecture of the system developed. Furthermore, the methodology of engaging all different participants in a workshop is also described. The wiki page(s) on the Connected Henney are also gateways to the IoF2020 project, the other LSPs and Poultry Management Chain use case.

4.4 The relation with IoF2020

As above described, there was a close interaction with the described use case until the change of its coordination. Information gathered during that interaction was crucial specially for a better understanding of the use case itself and of its more positive aspects that were highlighted during the workshop.

At the time of the writings of this text a new momentum of interaction with IoF2020 is starting. Potential follow up on this case study will be discussed.

4.5 Presentation/interaction method

The interaction methods proposed by this case study and all others to come is key for the purpose of engaging all relevant players in the process of the LSPs. The aim is to encompass a communication interface inspired by the artistic work. Through the dialogues generated during the workshops it is targeted to:

- Communicate the LSPs programme, the specific LSP and the specific use case to:
 - Citizens and consumers.
 - SMEs and start-ups.
 - Local and regional policy makers.
- Get feedback from those participants to be communicated to the LSPs as useful information to improve the project.
- Stimulate adoption and uptake of IoT in general and more specifically of the technologies and appliances of the use case being addressed.

The methodology develops around the assembling of the Connected Henery as an inspiration for others to create their own applications of IoT utilizing the ideas put forward in the LSPs. The artwork is crucial in all this because it creates a strangeness and curiosity key to stimulate engagement. In other words, it is a provocation that opens up the mind of participants to face realities from different perspectives.

4.6 Follow up with companies

At this stage conversations are taking place with ALTICE and LUSIAVES to pursue further interactions of the workshop. In the case of ALTICE this could be done in the context of their IoT Lab. In LUSIAVES a context needs to be created for the deployment of more workshops. Contacts were established with another company that was not involved in the workshops, MICROIO. The idea is to pursue the possibility of developing a product after the Connected Henery artwork. Technical improvements such as reliability of the structure and integration of more sensors in the system were determined as key task in order to proceed with the planned product development.

5. CONCLUSIONS

5.1 Contribution to overall picture

The aim of the Connected Hennerly is to test and provide a model of activity that can mostly generate dialogues about the LSPs. A strong background aim is to contribute to the communication of advancements facilitated by EU investments in IoT. They normally do not reach citizens and small companies which are considered as the most relevant potential up-takers and adopters of the innovations made possible by the LSPs. The artistic approach is extremely relevant in this because it is believed that IoT differs from previous technological developments because the success of IoT in general depends on the creativity of entrepreneurs to make innovative combinations of-the-shelf sensors, actuators and algorithms.

5.2 Impacts to other WPs and Tasks

The work done strongly contributes to the dissemination and communication work-packages. Although the aim of the work is not just dissemination and communication about the LSPs, working with arts intrinsically involves those activities.

5.3 Contribution to demonstration

The Connected Hennerly partially demonstrates technologies put in place by the Poultry Chain Management use case of IoF2020. It can in the future integrate more sensors from the use case itself. During the development phase, there was a shortage of sensors used in the use case.

In any case, as the majority of the artworks, The Connected Hennerly is a representation of a thing. It is not the thing itself. Further improvements in the technologies applied are being pursued as exposed above.

5.4 Other conclusions and lessons learned

The realization of the first experimental co-creation workshop around the Connected Hennerly artwork proved that the model of interaction works. Different perspectives of all involved have an impact on the way the subject in discussion is perceived. The practical approach and ludic aspect of the workshop allows for better interaction between participants. Furthermore, the fact that the artwork transports people to a mind of the curiosity for the unknown their engagement also improves.

A relevant aspect is that since the workshop is of a generalist nature, it helps diverting attention from technical aspects and with this, from very specific terminology that is only understood by specialists. From the side of technical specialist, it helps taking them away from the box that is natural to their work. They become aware of aspects of the work they do that normally they do not perceive.

6. REFERENCES

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